

Richard Zhang

Email (rizhang@adobe.com) • Homepage • GitHub • Scholar
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SUMMARY

Forefront of deep learning for image synthesis (“GenAI”) for 7+ years, starting from PhD dissertation. Improving perceptual quality, controllability, inference speed, diversity, and data transparency for GenAI. Recognized as an Innovator Under 35 by MIT Tech Review in 2023.

INDUSTRIAL RESEARCH

Adobe Research

Senior Research Scientist, San Francisco, CA
Research Scientist, San Francisco, CA
Research Intern, Seattle, WA

Jan 2022 – Present
May 2018 – Dec 2021
May – Aug 2017

EDUCATION

University of California, Berkeley, Berkeley, CA

- Ph.D. in Electrical Engineering and Computer Sciences (EECS) Aug 2012 – May 2018
 - Thesis: Image Synthesis for Self-Supervised Visual Representation Learning
 - Advisor: Prof. Alexei A. Efros

Cornell University, Ithaca, NY

- M.Eng. in Electrical & Computer Engineering (ECE) Aug 2009 – May 2010
 - Cumulative GPA: 4.13 / 4.30
- B.S. in Electrical & Computer Engineering (ECE) Aug 2006 – Dec 2009
 - Cumulative GPA: 4.02 / 4.30, Summa Cum Laude, Dean’s List all semesters

PUBLICATIONS

CONFERENCE

- [41] S. Fu*, N. Tamir*, S. Sundaram*, L. Chai, R. Zhang, T. Dekel, P. Isola. **DreamSim: Learning New Dimensions of Human Visual Similarity using Synthetic Data.** In *NeurIPS* (spotlight), 2023.
- [40] S.Y. Wang, A.A. Efros, J.Y. Zhu, R. Zhang. **Evaluating Data Attribution for Text-to-Image Models.** In *ICCV*, 2023.
- [39] N. Kumari, B. Zhang, S.Y. Wang, E. Shechtman, R. Zhang, J.Y. Zhu. **Ablating concepts in text-to-image diffusion models.** In *ICCV*, 2023.
- [38] G. Parmar, K. K. Singh, R. Zhang, Y. Li, J. Lu, J.Y. Zhu. **Zero-shot Image-to-Image Translation.** In *SIGGRAPH*, 2023.
- [37] N. Kumari, B. Zhang, R. Zhang, E. Shechtman, J.Y. Zhu. **Multi-Concept Customization of Text-to-Image Diffusion.** In *CVPR*, 2023.
- [36] M. Kang, J.Y. Zhu, R. Zhang, J. Park, E. Shechtman, S. Paris, T. Park. **Scaling up GANs for Text-to-Image Synthesis.** In *CVPR* (highlight), 2023.
- [35] Y. Nitzan, M. Gharbi, R. Zhang, T. Park, J.Y. Zhu, D. Cohen-Or, E. Shechtman. **Domain Expansion of Image Generators.** In *CVPR*, 2023.
- [34] M. Huh, H. Mohabi, R. Zhang, B. Cheung, P. Agrawal, P. Isola. **The Low-Rank Simplicity Bias in Deep Networks.** In *TMLR*, 2023.
- [33] L. Chai, M. Gharbi, E. Shechtman, P. Isola, R. Zhang. **Any-resolution Training for High-resolution Image Synthesis.** In *ECCV*, 2022.
- [32] D. Epstein, T. Park, R. Zhang, E. Shechtman, A. A. Efros. **BlobGAN: Spatially Compositional Scene Representations.** In *ECCV*, 2022.
- [31] Y. Liu, Z. Shu, Y. Li, Z. Lin, R. Zhang, S.Y. Kung. **3D-FM GAN: Towards 3D-Controllable Face Manipulation.** In *ECCV*, 2022.
- [30] D. Liu, S. Shetty, T. Hinz, M. Fisher, R. Zhang, T. Park, E. Kalogerakis. **ASSET: Autoregressive Semantic Scene Editing with Transformers at High Resolutions.** In *SIGGRAPH*, 2022.
- [29] W. Peebles, J.Y. Zhu, R. Zhang, A. A. Efros, A. Torralba, E. Shechtman. **GAN-Supervised Dense Visual Alignment** In *CVPR*, 2022 (oral, best paper finalist).
- [28] N. Kumari, R. Zhang, E. Shechtman, J.Y. Zhu. **Ensembling Off-the-shelf Models for GAN Training.** In *CVPR*, 2022 (oral).
- [27] G. Parmar, R. Zhang, J.Y. Zhu. **On Aliased Resizing Libraries and Surprising Subtleties in FID Calculation.** In *CVPR*, 2022.

- [26] G. Parmar, Y. Li, J. Lu, R. Zhang, J.Y. Zhu, K. Singh. **Multilayer GAN Inversion and Editing**. In CVPR, 2022.
- [25] S. Liu, X. Zhang, Z. Zhang, R. Zhang, J.Y. Zhu, B. Russell. **Editing Conditional Radiance Fields**. In ICCV, 2021.
- [24] R. Alghofaili, M. Fisher, R. Zhang, M. Lukáč, L.F. Yu. **Exploring Sketch-based Character Design Guided by Automatic Colorization**. In Graphics Interfaces, 2021.
- [23] L. Chai, J.Y. Zhu, E. Shechtman, P. Isola, R. Zhang. **Ensembling with Deep Generative Views**. In CVPR, 2021.
- [22] U. Ojha, Y. Li, J. Lu, A. A. Efros, Y.J. Lee, E. Shechtman, R. Zhang. **Few-shot Image Generation via Cross-domain Correspondence**. In CVPR, 2021.
- [21] J. Lin, R. Zhang, F. Ganz, S. Han, J.Y. Zhu. **Anycost GANs for Interactive Image Synthesis and Editing**. In CVPR, 2021.
- [20] T. R. Shaham, M. Gharbi, R. Zhang, E. Shechtman, T. Michaeli. **Spatially-Adaptive Pixelwise Networks for Fast Image Translation**. In CVPR, 2021.
- [19] P. Manocha, Z. Jin, R. Zhang, A. Finkelstein. **CDPAM: Contrastive learning for perceptual audio similarity**. In ICASSP, 2021.
- [18] Y. Li, R. Zhang, J. Lu, E. Shechtman. **Few-shot Image Generation with Elastic Weight Consolidation**. In NeurIPS, 2020.
- [17] T. Park, J.Y. Zhu, O. Wang, J. Lu, E. Shechtman, A. A. Efros, R. Zhang. **Swapping Autoencoder for Deep Image Manipulation**. In NeurIPS, 2020.
- [16] T. Park, A. A. Efros, R. Zhang, J.Y. Zhu. **Contrastive Learning for Unsupervised Image-to-Image Translation**. In ECCV, 2020.
- [15] M. Huh, R. Zhang, J.Y. Zhu, S. Paris, A. Hertzmann. **Transforming and Projecting Images into Class-conditional Generative Networks**. In ECCV, 2020 (oral).
- [14] P. Manocha, A. Finkelstein, R. Zhang, N. J. Bryan, G. J. Mysore, Z. Jin. **A Differentiable Perceptual Audio Metric Learned from Just Noticeable Differences**. In Interspeech, 2020.
- [13] S. Wang, O. Wang, R. Zhang, A. Owens, A. A. Efros. **CNN-generated images are surprisingly easy to spot...for now**. In CVPR, 2020 (oral).
- [12] D. Smirnov, M. Fisher, V. Kim, R. Zhang, J. Solomon. **Deep Parametric Shape Predictions using Distance Fields**. In CVPR, 2020.
- [11] N. Fish, R. Zhang, L. Perry, D. Cohen-Or, E. Shechtman, C. Barnes. **Image Morphing with Perceptual Constraints and STN Alignment**. In CGF, 2020.
- [10] S. Wang, O. Wang, A. Owens, R. Zhang, A. A. Efros. **Detecting Photoshopped Faces by Scripting Photoshop**. In ICCV, 2019.
- [9] A. Ghosh, R. Zhang, P. K. Dokania, O. Wang, A. A. Efros, P. H.S. Torr, E. Shechtman. **Interactive Sketch & Fill: Multiclass Sketch-to-Image Translation**. In ICCV, 2019.
- [8] R. Zhang. **Making Convolutional Networks Shift-Invariant Again**. In ICML, 2019.
- [7] R. Zhang, P. Isola, A. A. Efros, E. Shechtman, O. Wang. **The Unreasonable Effectiveness of Deep Features as a Perceptual Metric**. In CVPR, 2018.
- [6] J.Y. Zhu, R. Zhang, D. Pathak, T. Darrell, A. A. Efros, O. Wang, E. Shechtman. **Toward Multimodal Image-to-Image Translation**. In NIPS, 2017.
- [5] R. Zhang*, J.Y. Zhu*, P. Isola, X. Geng, A. S. Lin, T. Yu, A. A. Efros. **Real-Time User-Guided Image Colorization with Learned Deep Priors**. In SIGGRAPH, 2017. (*equal contribution)
- [4] R. Zhang, P. Isola, A. A. Efros. **Split-Brain Autoencoders: Unsupervised Learning by Cross-Channel Prediction**. In CVPR, 2017.
- [3] R. Zhang, P. Isola, A. A. Efros. **Colorful Image Colorization**. In ECCV, 2016 (oral).

- [2] R. Zhang, S. Candra, K. Vetter, A. Zakhor. *Sensor Fusion for Semantic Segmentation for Urban Scenes*. In *ICRA*, 2015.
- [1] R. Zhang and A. Zakhor. *Automatic Identification of Window Regions on Indoor Point Clouds Using LiDAR and Cameras*. In *WACV*, 2014.

WORKSHOP/PREPRINTS

- [iii] D. Epstein, I. Jain, O. Wang, R. Zhang. *Online Detection of AI-Generated Images*. In *ICCV DFAD Workshop*, 2023.
- [ii] A. Andonian, T. Park, B. Russell, P. Isola, J.Y. Zhu, R. Zhang. *Contrastive Feature Loss for Image Prediction*. In *ICCV AIM Workshop*, 2021.
- [i] A.X. Lee, R. Zhang, F. Ebert, P. Abbeel, C. Finn, S. Levine. *Stochastic Adversarial Video Prediction*. In *ArXiv*, 2018.

AWARDS

35 Innovators Under 35 , MIT Technology Review	Sep 2023
Best Paper Finalist , CVPR 2022	Jul 2022
Paper Reviewing Recognitions	
▪ ECCV, top reviewer	Oct 2022
▪ NeurIPS, top 10% reviewer	Dec 2020
▪ ECCV, top reviewer	Oct 2020
▪ NeurIPS, top 50% reviewer	Dec 2019
▪ CVPR, outstanding reviewer	Jul 2019
Best Presentation Award , SIGGRAPH Thesis Fast Forward	Jul 2018
Adobe Research Fellowship	Jan 2017
William S. Einwechter Award , Cornell University	May 2010

COMMUNITY SERVICE

AREA CHAIR

Computer Vision and Pattern Recognition (CVPR)	2020-21, 2023-24
British Machine Vision Conference (BMVC)	2022

PAPERS REVIEWED

Computer Vision and Pattern Recognition (CVPR)	2018-19, 2022
European Conference on Computer Vision (ECCV)	2018-22
International Conference on Computer Vision (ICCV)	2017-19, 2023
Neural Information Processing Systems (NIPS, NeurIPS)	2016-21
International Conference in Machine Learning (ICML)	2019-20
Special Interest Group in Graphics (SIGGRAPH)	2017-19, 20-23
Special Interest Group in Graphics, Asia (SIGGRAPH Asia)	2017-19, 2021
International Conference on Robotics and Automation (ICRA)	2015, 2018
International Journal of Computer Vision (IJCV)	2019, 2021
Transactions in Pattern Analysis and Machine Intelligence (TPAMI)	2018
Transactions in Image Processing (TIP)	2017-18
Technical Committee on Vision and Graphics (TCVG)	2018
Pacific Graphics	2018
Eurographics	2019

WORKSHOP ORGANIZATION COMMITTEE

Sketching for Human Expressivity (SHE), at ECCV 2022	Oct 2022
Advancements in Image Manipulation (AIM), at ICCV 2019	Nov 2019
New Trends in Image Restoration and Enhancement (NTIRE), at CVPR 2019	Jul 2019

SELECTED PUBLICITY

TWiML (This Week in ML) Podcast. <i>Visual Generative AI Ecosystem Challenges</i> .	Dec 2023
Adobe Blog. <i>MIT Technology Review names Adobe Research's Richard Zhang a top "Innovator Under 35" for groundbreaking generative AI and image forensics work</i> .	Sep 2023
Time. <i>The Best Inventions of 2021: Adobe Super Resolution</i> .	Nov 2021
Adobe Research Blog. <i>Advancing the Science of Image Forensics</i> .	Jan 2020
Adobe MAX (Sneak Peek). <i>Project About Face</i> .	Nov 2019
The Verge. <i>Adobe's prototype AI tool automatically spots Photoshopped faces</i> .	Jun 2019

	The New Yorker. <i>In the Age of A.I., Is Seeing Still Believing?</i>	Nov 2018
	Adobe Research Blog. <i>With Deep Learning, Computers See Images More Like Humans Do.</i>	May 2018
	UK Times. <i>Computers give the past a blast of colour.</i>	Apr 2016
	Reddit (front page). <i>Use deep learning algorithms to add color to black and white images.</i>	Jun 2016
	TechCrunch. <i>This neural network ‘hallucinates’ the right colors into black and white pictures.</i>	Mar 2016
INVITED PRESENTATIONS	<i>Perception, Generation, & Forensics</i>	
	Video Quality Experts Group (VQEG) Panel	Jun 2023
	<i>Colourisation and Any-resolution Generation</i>	
	CeADAR Tech Talk	Jan 2023
	<i>Anycost and Any-resolution Image Synthesis</i>	
	CVPR New Trends in Image Restoration (NTIRE), AI for Content Creation (AICC) workshops	Jun 2022
	Netflix Seminar	Aug 2022
	<i>The Unreasonable Effectiveness of Deep Features as a Perceptual Metric</i>	
	JPEG Workshop on Subjective Quality Assessment	Jun 2022
	<i>Swapping Autoencoder for Deep Image Manipulation</i>	
	Rework Deep Learning Summit, Generative Models Stage	Jan 2021
	<i>Deep Learning for Computer Vision and Graphics</i>	
	Illinois Mathematics and Science Academy, Intersession	Jan 2021
	<i>Detecting Generated Imagery, Deep and Shallow</i>	
	Learning-Based Image Synthesis, CMU	May 2021
	ECCV Sensing, Understanding and Synthesizing Workshop	Aug 2020
	<i>Style and Structure Disentanglement for Image Manipulation</i>	
	ECCV Advances in Image Manipulation (AIM) Workshop	Aug 2020
	<i>Analyzing CNN Artifacts in Discriminative and Generative Models</i>	
	Machine Learning @ Berkeley invited seminar talk	Sep 2020
	Graphics and Mixed Environment (GAMES) Webinar	Aug 2020
	CVPR Area Chair Workshop	Mar 2020
	<i>Making Convolutional Networks Shift-Invariant Again</i>	
	Simon Fraser University, CMPT 361 Intro to Vision, Invited Lecture	Sep 2020
	Berkeley AI Research (BAIR) Seminar	Aug 2019
	International Conference on Machine Learning (ICML)	Jun 2019
	Google Research, Cambridge, MA	May 2019
	<i>Modeling Perceptual Similarity and Shift-Invariance in Deep Networks</i>	
	NAVER Labs, Tech talk	Oct 2019
	University College London, Smart Geometry Processing Group seminar	Oct 2019
	Oxford University, VGG seminar	Oct 2019
	Scale.AI, seminar talk	Aug 2019
	Toyota Technological Institute of Chicago (TTIC), Young Researcher Talk	May 2019
	Massachusetts Institute of Technology (MIT), Computer Vision Seminar	Apr 2019
	<i>Deep Learning for Content Synthesis</i>	
	Association for Content Editors (ACE) Tech Day with Adobe	Sep 2019
	Hollywood Professional Association (HPA) Tech Retreat	Feb 2019
	<i>Image Synthesis for Self-Supervised Visual Representation Learning</i>	
	Stanford University, Graphics Group; University of Michigan, Computer Vision Group	Jan 2019
	Berkeley Special Topics in Deep Learning Seminar, CS 294-131	Nov 2018
	SIGGRAPH 2018 Thesis Fast Forward (3 min)	Jul 2018
	Berkeley AI Research (BAIR) Seminar, Dissertation Talk	Apr 2018
	Alibaba Research; Amazon AI Deep Learning; DeepScale; Facebook AML; Fyusion;	Mar 2018
	Google Research; Intel Intelligent Systems; NVIDIA Research	

	Adobe Research; Allen Institute for AI (AI2); Amazon A9; Apple Turi; eBay Research; Snap Research; WaveOne	Feb 2018
	Multimodal Image-to-Image Translation University of Washington, Graphics and Imaging Lab (GRAIL)	Jul 2018
	Real-Time User-Guided Image Colorization with Learned Deep Priors Special Interest Group on Computer Graphics and Interactive Techniques (SIGGRAPH) NVIDIA SIGGRAPH Innovation Theater	Aug 2017 Aug 2017
	Cross-Channel Visual Prediction Graphics and Mixed Environment (GAMES) Webinar Global AI Hackathon Webinar Berkeley AI Research (BAIR) Seminar	Oct 2017 Jun 2017 Apr 2017
	Colorful Image Colorization Berkeley AI Research (BAIR) Seminar European Conference on Computer Vision (ECCV) Oxford University; INRIA Paris; INRIA Sophia Antipolis; École des Ponts ParisTech	Sep 2017 Oct 2016 Jun 2016
	Sensor Fusion for Semantic Segmentation for Urban Scenes Berkeley Deep Drive (BDD) Kickoff Amazon Computer Vision PhD Symposium International Conference on Robotics and Automation (ICRA)	Mar 2016 Oct 2015 Mar 2015
	Automatic Identification of Window Regions on Indoor Point Clouds Using LiDAR and Cameras Winter Conference on Applications of Computer Vision (WACV) Microsoft Research (MSR) Computer Vision Group	May 2014 Jan 2014
TEACHING EXPERIENCE	Berkeley EECS Department <ul style="list-style-type: none"> ▪ CS 188 Intro to Artificial Intelligence, <i>Graduate Student Instructor</i> <ul style="list-style-type: none"> • Instructor: Prof. Anca Dragan ▪ CS 280 Computer Vision, <i>Graduate Student Instructor</i> <ul style="list-style-type: none"> • Instructor: Prof. Alexei A. Efros 	Jan – May 2017 Jan – May 2016
	Cornell ECE Department <ul style="list-style-type: none"> ▪ ECE 2100 Intro to Circuits, <i>Teaching Assistant</i> <ul style="list-style-type: none"> • Instructor: Prof. Alyosha Molnar ▪ ECE 2100 Intro to Circuits, <i>Course Assistant</i> <ul style="list-style-type: none"> • Instructor: Prof. John Belina 	Jan – May 2010 Aug – Dec 2008
VOLUNTEER EXPERIENCE	Illinois Math and Science Academy (IMSA), Intersession Instructor Berkeley AI Research (BAIR) Mentorship Program, Mentor Clarksville Middle School, Howard County Public School System, Volunteer	Jan 2014, Jan 2021 Aug – Dec 2017 Dec 2010 – May 2011
INDUSTRY EXPERIENCE	Johns Hopkins University Applied Physics Laboratory (JHU/APL), Laurel, MD <ul style="list-style-type: none"> ▪ Missile Defense Radar Engineering Group, Air & Missile Defense Dept (AMDD), <i>Staff Engineer</i> ▪ Electro-Optical & Infrared Systems and Technologies Group, AMDD 	Jul 2010 – Jul 2012
LANGUAGES	Chinese (Mandarin) – Conversational	